



US 20190371450A1

(19) **United States**(12) **Patent Application Publication****Lou et al.**(10) **Pub. No.: US 2019/0371450 A1**(43) **Pub. Date: Dec. 5, 2019**(54) **DECISION SUPPORT SYSTEM FOR MEDICAL THERAPY PLANNING**(71) Applicant: **Siemens Healthcare GmbH**, Erlangen (DE)(72) Inventors: **Bin Lou**, Princeton, NJ (US); **Ali Kamen**, Skillman, NJ (US)(21) Appl. No.: **16/270,743**(22) Filed: **Feb. 8, 2019****Related U.S. Application Data**

(60) Provisional application No. 62/677,716, filed on May 30, 2018, provisional application No. 62/745,712, filed on Oct. 15, 2018.

Publication Classification(51) **Int. Cl.**
G16H 20/40 (2006.01)
A61B 5/00 (2006.01)**G16H 50/20** (2006.01)**G06N 20/00** (2006.01)**G16H 50/30** (2006.01)**G16H 10/60** (2006.01)(52) **U.S. Cl.**CPC **G16H 20/40** (2018.01); **A61B 5/7267** (2013.01); **G16H 50/20** (2018.01); **G16H 50/50** (2018.01); **G16H 50/30** (2018.01); **G16H 10/60** (2018.01); **G06N 20/00** (2019.01)(57) **ABSTRACT**

For decision support in a medical therapy, machine learning provides a machine-learned generator for generating a prediction of outcome for therapy personalized to a patient. Deep learning may result in features more predictive of outcome than handcrafted features. More comprehensive learning may be provided by using multi-task learning where one of the tasks (e.g., segmentation, non-image data, and/or feature extraction) is unsupervised and/or draws on a greater number of training samples than available for outcome prediction alone.

